

Application Number 10/626,212
Amendment dated 11 February 2005
Reply to Office Action of 19 November 2004

Amendments to the Claims

This listing of claims will replace all prior versions, and listings, of claims in the application:

Claim 1 (cancelled).

Claim 2 (currently amended): The method of ~~Claim 7, Claim 6,~~ wherein the plasma comprises a nitrogen excited species.

Claim 3 (cancelled).

Claim 4 (currently amended): The method of ~~Claim 7, Claim 6,~~ wherein the atomic layer deposition comprises depositing an oxide having a higher dielectric constant than silicon nitride.

Claim 5 (original): The method of claim 4, wherein the oxide is selected from the group consisting of aluminum oxide, zirconium oxide, hafnium oxide, barium strontium titanate and strontium bismuth tantalate.

Claim 6 (currently amended): A method of depositing a film over ~~a~~ on a semiconductor surface in a partially fabricated integrated circuit, the method comprising:

exposing the surface to products of a plasma, thereby modifying termination of the semiconductor surface without significantly affecting bulk properties beneath the surface; and

after modifying the surface termination, depositing a layer thereover using an atomic layer deposition process;

wherein exposing incorporates less than 10 atomic % of the products of the plasma at a depth of greater than about 10 Å from the surface.

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Claim 7 (cancelled).

Claim 8 (currently amended): The method of Claim 7, Claim 6, wherein the plasma is generated remote from the surface.

Claim 9 (currently amended): A method of depositing a film ~~over a~~^a ~~on~~^a semiconductor surface in a partially fabricated integrated circuit, the method comprising:

exposing the surface to products of a plasma, thereby modifying termination of the semiconductor surface without significantly affecting bulk properties beneath the surface; and

after modifying the surface termination, depositing a layer thereover using an atomic layer deposition process;

wherein the atomic layer deposition process comprises a metal oxide deposition.

Claim 10 (currently amended): A method of depositing a film ~~over a~~^a ~~on~~^a semiconductor surface in a partially fabricated integrated circuit, the method comprising:

exposing the surface to products of a plasma, thereby modifying termination of the semiconductor surface without significantly affecting bulk properties beneath the surface; and

after modifying the surface termination, depositing a layer thereover using an atomic layer deposition process;

wherein the atomic layer deposition process comprises two reactant pulses with intervening purge pulses in each cycle.

Claim 11 (cancelled).

Claim 12 (previously presented): The method of Claim 19, wherein the plasma comprises a nitrogen excited species.

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Claim 13 (cancelled).

Claim 14 (previously presented): The method of Claim 19, wherein the atomic layer deposition comprises depositing an oxide having a higher dielectric constant than silicon nitride.

Claim 15 (original): The method of claim 14, wherein the oxide is selected from the group consisting of aluminum oxide, zirconium oxide, hafnium oxide, barium strontium titanate and strontium bismuth tantalate.

Claim 16 (cancelled).

Claim 17 (previously presented): The method of Claim 19, wherein the plasma is generated remote from the surface.

Claim 18 (currently amended): A method of depositing a film ~~over a~~^a ~~on~~^a semiconductor surface in a partially fabricated integrated circuit, the method comprising:

exposing the surface to products of a plasma, thereby modifying termination of the semiconductor surface without depositing greater than one atomic monolayer of the products of the plasma on the surface; and

after modifying the surface termination, depositing a layer thereover using an atomic layer deposition process;

wherein the atomic layer deposition process comprises a metal oxide deposition.

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Claim 19 (currently amended): A method of depositing a film ~~ever-a-on a~~
semiconductor surface in a partially fabricated integrated circuit, the method comprising:

exposing the surface to products of a plasma, thereby modifying
termination of the surface without depositing greater than one atomic monolayer
of the products of the plasma on the surface; and

after modifying the surface termination, depositing a layer thereover using
an atomic layer deposition process;

wherein the atomic layer deposition process comprises two reactant
pulses with intervening purge pulses in each cycle.